

Claims

1. Plane element for floors, comprising a multilayer plate having a thin pressure and abrasion resistant panel (1) arranged at its top side, the panel in particular consisting of natural stone, and below this panel (1) a pressure resistant lightweight material layer (4) fixated by an adhesive connection, wherein grooves (3) are arranged in vertical edge surfaces and connection ledges (9) are arrangeable in said grooves (3) for connecting adjacently layed plates, characterized in that the lightweight material layer consists of expanded polypropylene foam.
2. Plane element according to claim 1, characterized in that the grooves (3) have a length smaller than the respective edge length of the lightweight material layer (4), and the lightweight material layer (4) and the panel (1) are flush and in contact with each other at corners of the element except for bumps in a boundary surface.
2. Plane element according to claim 1, characterized in that the lightweight material layer (4) comprises furrows (12) at its bottom side.
3. Plane element according to claim 1 or 2, characterized in that the lightweight material layer (4) comprises furrows (12) at its top side.
4. Plane element according to claim 2 or 3, characterized in that the furrows (12) run along two orthogonal directions on at least one side of the lightweight material layer (4).
5. Plane element according to one of the claims 2 to 4, characterized in that the furrows (2) have a depth of 1 mm to 10 mm from the surface.

6. Plane element according to one of the preceding claims, characterized in that the lightweight material layer (4) comprises openings (13) having a depth corresponding with a thickness of the lightweight material layer (4).
- 5 7. Plane element according to claim 6, characterized in that the openings (13) are at least partially arranged at locations where, respectively, the furrows (12) of the top side and/or the furrows (12) of the bottom side would cross if the openings (13) did not exist.
- 10 8. Plane element according to one of the preceding claims, characterized in that a two-dimensional reinforcement (2) is glued at least to partial areas between the natural stone panel (1) and the lightweight material layer (4), the reinforcement (2) having a high stability and, in comparison to the natural stone panel (1), a high Young's modulus and a small thickness.
- 15 9. Plane element according to claim 8, characterized in that the two-dimensional reinforcement (2) is arranged surface-wide or in strips and consists of CFRP, CFRP fabric, glass fibre or metal.
10. Plane element according to claim 8 or 9, characterized in that the reinforcement (2) is arranged within the lightweight material layer (4).
- 20 11. Plane element according to claim 10, characterized in that slits or grooves for receiving strip-shaped reinforcements (2) are worked into the lightweight material layer (4).
12. Plane element according to one of the preceding claims, characterized in that it is quadratic having an edge length of 300 to 500 mm and a thickness of 10 to 20 mm.

13. Plane element according to one of the preceding claims, characterized in that the connection ledges (9) comprise two horizontal blades (9.1) and a vertical blade (9.2) which is directed upwards, wherein the thickness of the horizontal blades (9.1) is slightly smaller than the width of the grooves (3), and the top border of the vertical blade (9.2) approximately flushes with the surface of the natural stone panel (1).

14. Plane element according to claim 13, characterized in that an auxiliary part of a different material is inserted into the lightweight material layer (4) for fixating the connection ledges (9), the auxiliary part comprising a groove into which the horizontal blades (9.1) of the connection ledges (9) engage.

15. Plane element according to claim 13 or 14, characterized in that the vertical blades (9.2) are provided with a colored edge lipping (11) at the top.

16. Plane element according to one of the claims 13 to 15, characterized in that the horizontal blades (9.1) comprise sections of reinforced thickness for clamping the connection ledges (9) into the grooves (3).

17. Plane element according to one of the claims 13 to 16, characterized in that the connection ledges (9) are arranged along both joint directions of the whole arrangement of the multilayer plates and are connected to each other at cross-over points of joints.

18. Plane element according to one of the preceding claims, characterized in that the length of connection ledges (9) corresponds to an edge length of the plane element or is shorter or longer than it, wherein the length of the horizontal blades of the connection ledges (9) corresponds to the length of the respective groove (3) or is shorter than it.

19. Plane element according to one of the preceding claims, characterized in that the connection ledges (9) meeting at cross-over points of joints form a miter at their upper edges.
20. Plane element according to one of the claims 2 to 19, characterized in that the furrows (12) penetrate the inner border of the grooves (3) and/or the border of the lightweight material layer (4).
21. Plane element according to one of the claims 2 to 19, characterized in that the furrows (12) do not penetrate the inner border of the grooves (3) and/nor the border of the lightweight material layer (4).
22. Plane element according to one of the preceding claims, characterized in that further layers are arranged between the panel (1) and the lightweight material layer (4).
23. Plane element according to one of the preceding claims, characterized in that further layers are arranged at the bottom side of the lightweight material layer (4).
24. Plane element according to one of the preceding claims, characterized in that the lightweight material layer is furnished with at least one fleece as a glue primer, onto which further layers are applied.